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The External return bends (22) having a predetermined configuration to provide a greater turbulence of the liquid passing through each said channels, said external return bend means being incorporated into and extending outwardly from said walls (20) and permanently attached to outer door frame (24).

The said heat exchanger further comprising two access doors (20) which are removable and sealed in a liquid tight fashion to allow accessibility simultaneously from two opposite directions without dismantling the entire unit, said doors being of substantially flat configuration.

CLAIMS

24R- Internal return bends (18) having a predetermined configuration adapted to provide a greater flow turbulence of the fluid passing through each said channels as per fig. 1 and fig. 11.

The internal return bend (18) is a rigid continuous flat plate bent in many inward and outward semi hexagonal shapes (fig 11).

25R- The inner return bend (18) are permanently fixed between adjacent heating plates (12) to provide liquid-tight conditions under high pressure.

29R- The inner return bend (18) are removable between adjacent heating plates (12) to provide liquid-tight conditions under high pressure.

31R- The vertical directional baffles (14) is provided with round solid bars (34) (fig 2) (it is also visible on Fig 1) attached at the end of (14), in order to reduce the risk of plugging with stringy materials.

32R- The EXTERNAL return bends (22) means having in cross-section a semi-octagonal configuration in order to adapted to provide a greater flow turbulence of the fluid passing through.

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38R- Each directional baffle (14) has a few PRESURE RELIEF HOLES (37), (38) or (39) in FIG 7. The pressure relief holes are located at the BOTTOM and has shapes of Square Triangular or Semi Circular. The PRESSURE RELIEF HOLES (ORIFICES) ALLOW REDUCTION OF PRESSURE FROM BUILD UP IN CASE OF BLOCKAGE BETWEEN ADJOINING CHANELES.

The pressure relief holes are located at the very bottom of the directional baffle (14) where the liquid starts to fill up.

40R- The Inlet flanges (28) an (30) comprises a transition means adapted to connect said inlet in a special manner which will cause any blockage to occur outside of the heat exchanger due to the reduced of passage by the liquid.

When the two transition inlets in Fig 18 and Fig 19 are connected together at the rectangular narrower ends, they form a natural restriction in which preferred location plugging first occur.